

AMENDMENTS TO THE CLAIMS

(IN FORMAT COMPLIANT WITH THE REVISED 37 CFR 1.121)

1-2. (CANCELED).

3. (CURRENTLY AMENDED) A method of recording data on a recording medium comprising:

mapping the data to a set of write symbols wherein each write symbol represents more than one bit of the data and wherein

5 the set of write symbols is defined by:

defining a set of variable write parameters;

a generating a plurality of candidate write symbols that specify different values for the variable write parameters;

10 generating a plurality of readout waveforms produced by the plurality of candidate write symbols;

analyzing the readout waveforms to determine a set of distinguishable readout waveforms; and

15 selecting selected ones of the plurality of candidate write symbols that correspond to the distinguishable readout waveforms to be included in the set of write symbols; and

writing the data to the medium using the set of write symbols.

4. (ORIGINAL) A method of recording data on a medium as recited in claim 3 wherein the medium is an optical disc.

5. (ORIGINAL) A method of recording data on a medium as recited in claim 3 wherein the medium is a phase change optical disc.

6. (ORIGINAL) A method of recording data on a medium as recited in claim 3 wherein the set of variable write parameters defines characteristics of a sequence of laser pulses.

a 7. (ORIGINAL) A method of recording data on a medium as recited in claim 3 wherein the set of variable write parameters defines the timing of a sequence of laser pulses.

8. (CURRENTLY AMENDED) A method of recording data on a medium as recited in claim 3 wherein writing the data to the medium includes inserting guard bands between the write symbols on a track.

9. (CURRENTLY AMENDED) A method of recording data on a medium as recited in claim 3 wherein writing the data to the medium includes inserting guard bands between the write symbols on a

track, wherein the guard bands are appropriately sized to avoid intersymbol interference.

10. (CURRENTLY AMENDED) A method of recording data on a medium as recited in claim 3 wherein writing the data to the medium includes inserting guard bands between the write symbols on a track, wherein the guard bands are appropriately sized to avoid thermal crosstalk.

a 11. (CURRENTLY AMENDED) A method of recording data on a medium as recited in claim 3 ~~wherein a~~ further comprising using matched filter is used detection to recover the data.

12. (ORIGINAL) A method of recording data on a medium as recited in claim 3 wherein a cross correlation coefficient is calculated to recover the data.

13. (ORIGINAL) A method of recording data on a medium as recited in claim 3 wherein a combination of a cross correlation coefficient and comparison of a DC level is used to recover the data.

14-15. (CANCELED).

16. (CURRENTLY AMENDED) A method of recording data on a recording medium comprising:

mapping the data to a set of write symbols wherein each write symbol represents more than one bit of the data and wherein the set of write symbols is defined by:

defining a set of variable write parameters;

generating a plurality of candidate write symbols that specify different values for the variable write parameters;

generating a plurality of readout waveforms in response to marks produced by the plurality of candidate write symbols;

analyzing the readout waveforms produced by the marks to determine a set of readout waveforms that match a read/write channel that includes the recording medium; and

selecting selected ones of the plurality of candidate write symbols that correspond to the readout waveforms that match the read/write channel that includes the recording medium to be included in the set of write symbols; and

writing the data to the medium using the set of write symbols.

17. (ORIGINAL) A method of recording data on a medium as recited in claim 16 wherein generating a plurality of candidate write symbols that specify different values for the variable write

parameters includes using a genetic algorithm to generate the plurality of candidate write symbols.

18. (ORIGINAL) A method of recording data on a medium as recited in claim 16 wherein generating a plurality of candidate write symbols that specify different values for the variable write parameters includes randomly generating the plurality of candidate
5 write symbols.

a 19. (ORIGINAL) A method of recording data on a medium as recited in claim 16 wherein generating a plurality of candidate write symbols that specify different values for the variable write parameters includes using expert knowledge to generate the
5 plurality of candidate write symbols.

20. (ORIGINAL) A method of recording data on a medium as recited in claim 16 wherein generating a plurality of candidate write symbols that specify different values for the variable write parameters includes using expert knowledge to generate an initial
5 set of candidate write symbols and using a genetic algorithm to refine the initial set of candidate write symbols.

21. (CURRENTLY AMENDED) A method of recording data on a medium as recited in claim 16 wherein generating a plurality of

candidate write symbols that specify different values for the variable write parameters includes selecting a pair of waveforms to represent individual channel bits.

22. (CURRENTLY AMENDED) A method of recording data on a medium as recited in claim 16 wherein generating a plurality of candidate write symbols that specify different values for the variable write parameters includes selecting a pair of waveforms to represent individual channel bits and shifting and adding combinations of the waveforms.

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23. (CURRENTLY AMENDED) A method of recording data on a medium as recited in claim 16 wherein generating a plurality of candidate write symbols that specify different values for the variable write parameters includes selecting a pair of waveforms to represent individual channel bits wherein ~~the~~ a spectrum of the pair of waveforms becomes band-limited and ~~closely resembling the channel's~~ resembles a spectrum of a signal-to-noise ratio, $SNR(f)$ of the read/write channel.

24. (CURRENTLY AMENDED) A method of recording data on a medium as recited in claim 16 wherein analyzing the readout waveforms produced by the marks to determine a set of readout waveforms that match a read/write channel that includes the

recording medium includes determining ideal readout waveforms that follow the read/write channel SNR spectrum.

25. (ORIGINAL) A method of recording data on a medium as recited in claim 16 wherein the medium is an optical disc.

26. (ORIGINAL) A method of recording data on a medium as recited in claim 16 wherein the medium is a phase change optical disc.

a 27. (ORIGINAL) A method of recording data on a medium as recited in claim 16 wherein the set of variable write parameters defines characteristics of a sequence of laser pulses.

28. (ORIGINAL) A method of recording data on a medium as recited in claim 16 wherein the set of variable write parameters defines the timing of a sequence of laser pulses.

29. (ORIGINAL) A method of recording data on a medium as recited in claim 16 wherein a Viterbi detector is used to recover the data.

30. (NEW) A method of recording data on a medium as recited in claim 11 wherein the matched filter detection comprises

comparing readout waveforms obtained from individual segments to waveforms in pre-stored tables using predetermined pattern recognition techniques.

31. (NEW) A method of recording data on a medium as recited in claim 11 wherein the matched filter detection comprises:
sampling a readout waveform signal;
normalizing an amplitude of the signal;
separating the signal into segments.

a 32. (NEW) A method of recording data on a medium as recited in claim 31 wherein the matched filter detection further comprises:

calculating a cross-correlation coefficient between the segments and patterns in a look-up table; and

comparing a DC level of the segments with the patterns in the look-up table.

33. (NEW) A method of recording data on a medium as recited in claim 3 wherein the variable write parameters comprise one or more of a height of a laser pulse, a duration of a laser pulse, a width of a cooling pulse following a heating pulse, an interval between adjacent laser pulses, and a power level of a laser pulse.